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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,837	03/21/2005	Klaus Grossmann	53368	9853
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EXAMINER				
BROWN, COURTNEY A				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/508,837

**Applicant(s)**

GROSSMANN ET AL.

**Examiner**

COURTNEY A. BROWN

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 February 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-14 is/are pending in the application.  
4a) Of the above claim(s) 13 and 14 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2-12 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)  
3) ☐ Information Disclosure Statement(s) (PTO/CIS)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

### **DETAILED ACTION**

Receipt of Amendments/Remarks filed on February 4, 2008 is acknowledged. Claim 1 stands cancelled. Claims 5 and 6 were amended. Claims 2-14 are pending. The restriction requirement is withdrawn for claims 2-12. The restriction requirement for claims 13 and 14 is maintained (see below). Claims 2-12 are being examined for patentability.

### ***Restriction***

The Examiner acknowledges receipt of Applicant's response to the restriction requirement filed on February 4, 2008. Applicant elected with traverse Group I, claims 2-10, drawn to a method for identifying herbicidally active substances. Applicant traversed on the grounds that the Examiner has failed to consider the claims as a whole and has further mischaracterized the corresponding special technical feature. Applicant's arguments, see pages 7-9, filed February 4, 2008, with respect to claims 2-12 have been fully considered and are persuasive. The previous restriction has been withdrawn. The restriction requirement for claims 13 and 14 is maintained and has been addressed below.

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

**Group I**

Claims 2-12, drawn to a method for identifying herbicidally active substances and to a method for controlling undesired vegetation.

**Group II**

Claims 13 and 14, drawn to a compound of formula (I) and a method for controlling undesired vegetation comprising applying the compound of formula (I) to vegetation.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: there is no common technical feature in groups I and II. The invention of the instant application lacks a special corresponding technical feature and does not make a contribution to the prior art. Therefore, the claims cannot be said to have unity of invention.

Thus the restriction requirement is deemed proper and **FINAL**.

***Examiner's Response to Applicant's Arguments/Remarks***

Applicant's arguments with respect to claims 2-10 have been considered but are moot in view of the new ground(s) of rejection.

Rejections and/or objections not reiterated from the previous Office Action are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set of rejections and/or objections presently being applied to the instant application.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted element is the compound of formula (I).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. (WO 99/67402) in view of Koga et al., (Biochimica et Biophysica Acta, 1209(1994), pp 200-206).

### ***Applicant's Invention***

Applicant claims a method for identifying a herbicidally active substance comprising: a.) bringing one or more enzymes selected from the group consisting of the enzymes tryptophan aminotransferase, indole-3-pyruvate decarboxylase, and indole -3-acetaldehyde oxidase into contact with one or more test substances to permit binding to

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the enzymes or the nucleic acid sequence, which encodes the said enzymes; b.) detecting if the test substance reduce or block transcription, translation or expression of at least one of the said enzymes; and c.) detecting if the test substance(which could be tryptophan, a tryptophan derivative, indole-3-pyruvate, an indole-3- pyruvate derivative, an indole-3- acetaldehyde or an indol-3-acetaldehyde derivative) reduces or blocks activity of at least one of the said enzymes or detecting if the test substance binds to one of the said enzymes( preferably tryptophan aminotransferase). Applicant also claims a method of identifying herbicidally active substance that comprises: a.) treating a test compound with a plant cell lysate which comprises at least one of the said enzymes or; b.) treating a test compound with one of the said enzymes which are either partially or fully purified and ;c.) the enzymatic activity of at least one of the said enzymes is determined in comparison with one of the other said enzymes that has or has not been treated with the test compound and selecting the compounds that reduce or block the activity of at least one of the said enzymes.

***Determination of the scope and the content of the prior art  
(MPEP 2141.01)***

Ward et al. teach methods to screen chemicals for herbicidal activity using recombinantly produced enzymes having AIR synthetase activity and the use of this method to identify herbicidal chemicals to suppress the growth of undesired vegetation (abstract and last paragraph of page1, claim 2, in part, of instant application). Ward et al. teach methods for using said herbicides to suppress the growth of plants such as

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weeds (page 2, paragraph 2, and claim 11, in part, of instant application). Ward et al. teach that novel herbicides can be discovered using high-throughput screens that implement recombinant DNA technology (page 1, claim 9 of instant application).

Ward et al. teach an *in vitro* assay useful for identifying inhibitors of enzymes encoded by essential plant genes, such as the AIR synthetase, comprising the steps of :

- a.) reacting an enzyme having AIR synthetase activity and a substrate in the presence of a suspected inhibitor (test substance of instant application) of the enzyme's function;
- b) comparing the rate of enzymatic activity in the presence of the suspected inhibitor to the rate of enzymatic activity under the same conditions in the absence of the suspected inhibitor; and
- c) determining whether the suspected inhibitor inhibits the AIR synthetase enzymatic activity ( page 19, last paragraph, claim 2, steps a and c of instant application).

Ward et al. also teach an *in vivo* assay for inhibitors of the AIR synthetase activity using plant tissue, plant seeds, or plant cells wherein the chemical (test substance of instant application) is applied to the plant tissue, plant seed, or plant cell and the growth or viability of the plant tissue, plant seed, or plant cell are determined after application of the chemical and compared (page 21, paragraph 2, and claim 10, in part, of instant application).

Ward et al. teach a method of identifying chemicals having the ability to inhibit plant growth or viability, comprising: (a) combining an enzyme having AIR synthetase activity in a first reaction mixture with a substrate of AIR synthetase under condition in which the enzyme is capable of catalyzing the synthesis of AIR; (b) combining the chemical (test substance of instant application) to be tested and the enzyme in a



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second reaction mixture with a substrate of AIR synthetase under the same conditions and for the same period of time as the first reaction mixture; and (c) determining and comparing the activity of the enzyme in the first and second reaction mixtures in order to determine if the chemical of step (b) has the ability to inhibit plant growth and viability (page 3, last paragraph and claim 16 of reference; claim 3, steps b and c, in part, of instant application.) In reference to claims 5-7 of instant application, Ward et. al teach, in detail, a method of identifying chemicals having the ability to inhibit plant growth or viability using substrates of AIR synthetase wherein the activity of the enzyme is determined measuring the AIR produced and the ADP derived from ATP in the reaction mixture (pages 4-5, claims 5-8 , in part, of instant application).

***Ascertainment of the difference between the prior art and the claims  
(MPEP 2141.02)***

The difference between the invention of the instant application and that of Ward et al. is that the instant invention requires the use of enzymes selected from the group consisting of tryptophan aminotransferase, indole-3-pyruvate decarboxylase, and indole-3-acetaldehyde oxidase in order to identify herbicidally active substances as opposed to using enzymes having AIR synthetase activity. It for this reason that the teaching of Koga et al. is joined. Koga et al. teach that Indole-3- acetic acid (IAA) plays an important role in plant growth and development. Koga et al. teach that L-tryptophan aminotransferase (tryptophan aminotransferase of instant application) is involved in IAA biosynthesis and that indolepyruvate decarbocylase is the rate-limiting step in this pathway (see abstract and introduction on page 241 claims 2-12, in part of

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instant application). Additionally, Koga et al. teaches, in an experiment that examines the synthesis of IAA, that the amounts of L-tryptophan decreased with increases in indolepyruvate decarboxylase activity, while the amounts of indole 3-acetaldehyde increased with increases in this activity (page 246 and figure 3, claims 5–7 of instant application).

***Finding of prima facie obviousness***

***Rationale and Motivation (MPEP 2142-2143)***

It would have been obvious to one having ordinary skill in the art at the time of the invention to combine the teachings of the two cited references to arrive at a method of identifying herbicidally active substances. Ward et al. teach that because AIR synthetase activity is essential in plants and that chemicals which inhibit AIR synthetase in plants are likely to have detrimental effects on plants and are potentially good herbicide compounds (page 2, last paragraph). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant application to find chemicals which inhibit another important pathway such as IAA, which is also essential to plant development and growth. One of ordinary skill in the art would have been motivated at the time of the instant invention to make this combination in order to receive the expected benefit of using the methods to identifying potential herbicides as taught by Ward et al with an understanding of the behavior of L-tryptophan aminotransferase in the IAA biosynthetic pathway as taught by Koga et al.

In reference to claim 12, it is routine to one of ordinary skill in the art, as evidenced by Noveroske in US Patent 3,869,273 (see column 16, lines 55-58) to formulate a compound with herbicidal or growth-regulatory activity with the aid of an adjuvant that is suitable for the formulation of agricultural compositions.

### ***Examiner's Response to Applicant's Remarks***

Applicant's arguments, see pages 9-15, filed February 4, 2008, with respect to the rejection(s) of claim(s) 2-10 under 35 USC § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found art references that positively recite a method for identifying herbicidally active substances and a method for controlling undesired vegetation.

### ***Conclusion***

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR Only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electron

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Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Courtney Brown, whose telephone number is 571-270-3284. The examiner can normally be reached on Monday-Friday from 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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